

CLAIMS

What is claimed is:

1. A composition comprising at least one dsRNA oligonucleotide and a pharmaceutical carrier, wherein upon administration to a subject suffering from an ocular disease associated with neovascularization or angiogenesis said dsRNA inhibits expression of a gene associated with neovascularization or angiogenesis in an ocular disease.
2. The composition according to claim 1 where the pharmaceutical carrier is selected from the group of a polymer, lipid, or micelle.
3. The composition according to claim 1 or claim 2 wherein said ocular disease is selected from the group consisting of stromal keratitis, uveitis, rubeosis, conjunctivitis, keratitis, blepharitis, sty, chalazion, iritis, macular degeneration, and retinopathy.
4. A composition according to any of claims 1-3 wherein said dsRNA inhibits expression of a gene selected from the group of pro-inflammatory pathway genes, pro-angiogenesis pathway genes, pro-cell proliferation pathway genes, and viral infectious agent genome RNA, and viral infectious agent genes.
5. A composition according to Claim 4 comprising at least two dsRNA molecules, where each dsRNA molecule inhibits expression of a gene selected from the group of pro-inflammatory pathway genes, pro-angiogenesis pathway genes, pro-cell proliferation pathway genes, and viral infectious agent genome RNA, and viral infectious agent genes.
6. A composition according to Claim 5 comprising at least three dsRNA molecules wherein at least one dsRNA molecule inhibits expression of VEGF, at least one dsRNA molecule inhibits expression of VEGF R1, and at least one dsRNA molecule inhibits expression of VEGF R2
7. A composition according to Claim 5 comprising at least two dsRNA molecules wherein at least one dsRNA molecule inhibits expression of basic FGF and at least one dsRNA molecule inhibits expression of FGF R.
8. A composition according to Claim 5 wherein said dsRNA molecules inhibit expression of one or more VEGF pathway genes, FGF pathway genes, or a combination thereof.

9. A composition according to Claim 5 wherein said dsRNA molecules inhibit expression one or more pro-angiogenesis genes, pro-inflammatory genes, or a combination thereof

10. A composition according to Claim 5 wherein said dsRNA molecules 5 inhibit expression of one or more pro-angiogenesis genes, herpes simplex virus genes, or a combination thereof.

11. A composition according to Claim 5 wherein said dsRNA molecules inhibit expression of one or more pro-angiogenesis genes, endothelial cell proliferation genes, or a combination thereof.

10 12. A composition according to Claim 5 wherein said dsRNA molecules inhibit expression of one or more pro-inflammation genes, herpes simplex virus genes, or a combination thereof.

13. A composition according to Claim 5 comprising at least three dsRNA molecules that inhibit expression of at least two or more genes.

15 14. A composition according to Claim 13 wherein said genes encode VEGF, VEGF R1, and VEGF R2.

15. A composition according to Claim 13 wherein said genes encode expression of basic FGF and FGF R.

16. A composition according to Claim 13 wherein said genes encode VEGF 20 pathway genes, FGF pathway genes, or a combination thereof.

17. A composition according to Claim 13 wherein said genes are pro-angiogenesis genes, pro-inflammatory genes, or a combination thereof.

18. A composition according to Claim 13 wherein said genes are pro-angiogenesis genes, herpes simplex virus genes, or a combination thereof.

25 19. A composition according to Claim 13 wherein said genes are pro-angiogenesis genes, endothelial cell proliferation genes, or a combination thereof.

20. A composition according to Claim 13 wherein said genes are pro-inflammation genes, herpes simplex virus genes, or a combination thereof.

21. A composition according to Claim 2 where said carrier is selected from the 30 group consisting of polycationic binding agent, cationic lipid, cationic micelle, cationic polypeptide, hydrophilic polymer grafted polymer, non-natural cationic polymer, cationic polyacetal, hydrophilic polymer grafted polyacetal, ligand functionalized cationic polymer, and ligand functionalized-hydrophilic polymer grafted polymer.

22. The composition according to any preceding claim wherein said dsRNA molecule is a dsRNA oligonucleotide.

23. A method for treating ocular disease in a subject, wherein said disease is characterized at least in part by neovascularization, comprising administering to said subject a composition comprising a dsRNA oligonucleotide and a pharmaceutically acceptable carrier, wherein said dsRNA oligonucleotide inhibits expression of a gene that promotes ocular neovascularization in said subject.

24. The method according to claims 23, wherein said ocular disease is in at least the anterior of the eye.

10 25. A method according to claim 23 wherein said composition is administered at a site distal to the eye selected from the group of subconjunctival, intravenous, and subcutaneous.

26. A method according to claim 23 wherein said composition is administered topically to the eye.

15 27. A method according to Claim 23 where said pharmaceutical carrier is selected from the group of a polymer, lipid, or micelle.

28. A method according to Claim 23 where the ocular disease is selected from the group of stromal keratitis, uveitis, rubeosis, conjunctivitis, keratitis, blepharitis, sty, chalazion, iritis, macular degeneration, and retinopathy.

20 29. A method according to Claim 23 wherein said the dsRNA inhibits expression of at least one gene selected from the group of pro-inflammatory pathway genes, pro-angiogenesis pathway genes, pro-cell proliferation pathway genes, and viral infectious agent genome RNA, and viral infectious agent genes.

30. A method according to Claim 23 wherein said dsRNA inhibits expression of more than one gene.

25 31. A method according to Claim 30 wherein said dsRNA inhibits expression of VEGF, VEGF R1, and VEGF R2.

32. A method according to Claim 30 wherein said dsRNA inhibits expression of basic FGF and FGF R.

30 33. A method according to Claim 30 wherein said dsRNA inhibits expression of VEGF pathway genes, FGF pathway genes, or a combination

34. A method according to Claim 30 wherein said dsRNA inhibits expression of pro-angiogenesis genes, pro-inflammatory genes, or a combination thereof.

35. A method according to Claim 30 wherein said dsRNA inhibits expression of pro-angiogenesis genes, herpes simplex virus genes, or a combination thereof.

36. A method according to Claim 30 wherein said dsRNA inhibits expression of pro-angiogenesis genes, endothelial cell proliferation genes, or a combination thereof.

5 37. A method according to Claim 30 wherein said dsRNA inhibits expression of pro-inflammation genes, herpes simplex virus genes, or a combination thereof.

38. A method according to Claim 30 wherein said dsRNA inhibits expression of more than two genes.

39. A method according to Claim 38 wherein said dsRNA inhibits expression 10 of VEGF, VEGF R1, and VEGF R2.

40. A method according to Claim 38 wherein said dsRNA inhibits expression of basic FGF and FGF R.

41. A method according to Claim 38 wherein said dsRNA inhibits expression of VEGF pathway genes, FGF pathway genes, or a combination thereof.

15 42. A method according to Claim 38 wherein said dsRNA inhibits expression of pro-angiogenesis genes, pro-inflammatory genes, or a combination thereof.

43. A method according to Claim 38 wherein said dsRNA inhibits expression of pro-angiogenesis genes, herpes simplex virus genes, or a combination thereof.

20 44. The method according to Claim 38 wherein said dsRNA inhibits expression of pro-angiogenesis genes, endothelial cell proliferation genes, or a combination thereof.

45. The method according to Claim 38 wherein said dsRNA inhibits expression of pro-inflammation genes, herpes simplex virus genes, or a combination thereof.

25 46. A method according to Claim 2 wherein said carrier is selected from the group of polycationic binding agent, cationic lipid, cationic micelle, cationic polypeptide, hydrophilic polymer grafted polymer, non-natural cationic polymer, cationic polyacetal, hydrophilic polymer grafted polyacetal, ligand functionalized cationic polymer, and ligand functionalized-hydrophilic polymer grafted polymer.

30 47. The method according to any of claims 23-46 wherein said subject is a human.